

Model 288 Helical Piers

Project: Mendards Mezzanine Addition

Location: La Crosse, WI

Date: January 2019

Challenge:

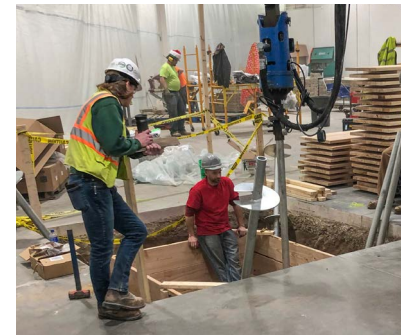
A 12,000 square foot mezzanine addition was planned inside the existing Menards home improvement store in La Crosse, Wisconsin. Foundations for an elevator addition and racking system were also required below the new mezzanine. The mezzanine and elevator additions would be supported using deep foundations at 40 new pile cap locations and the new rack system would be supported on deep foundations incorporated into a thickened slab. Some of the existing footings required additional piling to increase capacity for the mezzanine support. A boring advanced in the area showed about 11 feet of sandy rubble fill underlain by very loose to loose sand to a depth of about 45 feet where it transitioned to loose to medium dense sand to the termination of the boring. Groundwater was observed at a depth of about 10 feet. Timber piles with a design working compression load of 26 kips were originally specified for the new foundation support; however, concerns associated with constructability, noise and possible damage to existing foundations during driving prompted consideration of an alternative deep foundation system.

Solution:

Helical piers were selected as the preferred deep foundation alternative since the piers could be installed in the limited access area and near existing foundations without concern of damage due to vibration. The helical piers could also be installed with smaller, quieter equipment than what would have been required for a driven pile system. Foundation Supportworks® of Wisconsin was contracted to install 209 helical piers for the mezzanine, elevator and racking system additions. The helical pier design consisted of the Model 288 (2.875-inch OD by 0.276-inch wall) hollow round shaft with a 10"-12"-14" helix plate configuration. The helical piers were installed to lengths ranging from 70 to 110 feet after achieving torque-correlated ultimate capacities of at least 2 times the design working load of 26 kips. Predrilling through 9 to 14 feet of rubble fill was required at 35 pier locations. Foundation details for the elevator addition, new racking system, and mezzanine included 8, 39 and 162 piers, respectively. The 209 helical piers were installed in less than three weeks with multiple mobilizations required.

Project Summary

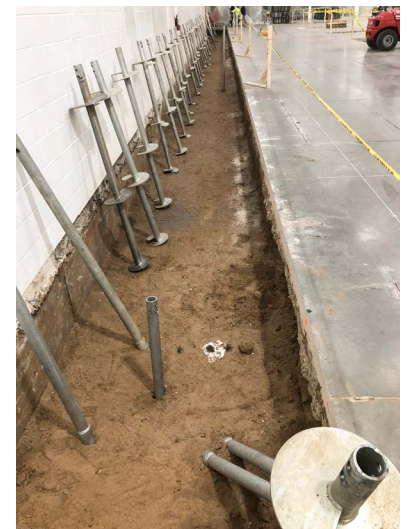
Geotechnical Engineer: Braun Intertec, Midwest Engineering Services
General Contractor: Bolton Construction
Pier Installer: Foundation Supportworks® of Wisconsin
Products Installed: (209) Supportworks® Model 288 Helical Piers, 10"-12"-14" Plate Configuration, Design Working Compression Load of 26 kips, Installed Lengths of 70 to 110 feet



Installing helical piers in pile cap



Helical piers with new construction caps and reinforcement



Helical piers at rack addition location



Completed mezzanine addition